Hospitalized Patients' Perceptions of Resident Fatigue, Duty Hours, and Continuity of Care

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Abstract

Background Physicians' perceptions of duty hour regulations have been closely examined, yet patient opinions have been largely unstudied to date.

Objective We studied patient perceptions of residency duty hours, fatigue, and continuity of care following implementation of the Accreditation Council for Graduate Medical Education 2011 Common Program Requirements.

Methods A cross-sectional survey was administered between June and August 2013 to inpatients at a large academic medical center and an affiliated community hospital. Adult inpatients on teaching medical and surgical services were eligible for inclusion in the study.

Results Survey response rate was 71.3% (513 of 720). Most respondents (57.1%, 293 of 513) believed residents should not be assigned to shifts longer than 12 hours, and nearly half (49.7%, 255 of 513) wanted to be notified if a resident caring for them had worked longer than 12 hours. Most patients (63.2%, 324 of 513) believed medical errors commonly occurred because of fatigue, and fewer (37.4%, 192 of 513; odds ratio, 0.56; $P < .01$) believed medical errors commonly occurred as a result of transfers of care. Given the choice between a familiar physician who "may be tired from a long shift" or a "fresh" physician who had received sign-out, more patients chose the fresh but unfamiliar physician (57.1% [293 of 513] versus 42.7% [219 of 513], $P < .01$).

Conclusions In a survey about physician attributes relevant to medical errors and patient safety, adult inpatients in a large and diverse sample reported greater concern about fatigue and working hours than about continuity of care.

Introduction

The association between resident fatigue and patient safety has been a central concern in the evolution of duty hour reform for nearly 3 decades. In response there has been progressive movement toward decreasing resident work hours in the name of increasing patient safety and improving the learning environment for trainees.[1]

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Since the earliest discussion of duty hour limits, studies have demonstrated an association between fatigue and diminished performance, increased stress, and potential for medical errors as well as threats to residents' personal safety through motor vehicle accidents and needle-stick injuries.[2–11] However, there is surprisingly little consensus regarding beneficial effects of decreased resident work hours on resident education or patient safety.[12]

In addition to a lack of data supporting a positive impact of duty hour limitations, reports have demonstrated mixed or negative perceptions of these standards from various groups of residents, faculty, and physicians in practice. Recent studies of program director and resident perceptions found that, although quality of life may be improved for first-year residents (interns), the impact on resident education has been negative. Although the effect on patient safety was felt to be unchanged, most respondents believed the frequency of handoffs had increased and continuity of care had decreased.[13–15] While sleep deprivation and fatigue have associated safety concerns, transitions of care and errors in communication have also been raised as issues for patient safety by researchers and major health care quality organizations,

TABLE 1 **Demographic Information of Survey Respondents**

	No. (%) of Respondents
Sex	
Men	254 (49.5)
Women	247 (48.1)
Not reported	12 (2.3)
Ethnicity	
White	395 (77.0)
Hispanic/Latino	64 (12.5)
Black	27 (5.3)
Asian	7 (1.4)
Other	14 (2.7)
Not reported	6 (1.2)
Have you been a patient in a teaching hospital (a hospital with residents) before?	
Yes	327 (63.7)
No	146 (28.5)
Not reported	9 (1.8)
Are you or any members of your family a resident or physician?	
Yes	58 (11.3)
No	445 (86.7)
Not reported	7 (1.4)
What is your primary reason for hospitalization?	
Medical	280 (54.6)
Surgical (operative)	216 (42.2)
Not reported	16 (3.2)

including the Joint Commission and the Agency for Healthcare Research Quality (AHRQ).[16–19]

In an interesting contradiction to the perspectives of residents and program directors, the public media has scrutinized the perceived inadequacy of resident work hour limits and emphasized ongoing issues with fatigue, in some cases sensationalizing the results of scientific studies with titles like "Long hospital shifts, sleep deprivation can kill."[20–24] Although many investigations have looked at physician perceptions of duty hours, fatigue, and transitions of care, few studies have evaluated patient or public perceptions outside of the public media.

A MEDLINE search identified 2 studies evaluating nonprovider perspectives of residency working conditions. In 2008, a small study of hospitalized patients (N = 124) concluded that most patients were well informed about resident work hours and were not concerned about fatigue or continuity of care.[25] In a larger public opinion study published in 2010, a random telephone survey of 1200 people found that the American public supported further regulation of resident work hours, with a majority reporting that shifts should be limited to 16 hours and that weekly work should be capped at 60 hours.[26]

What was known

Other than reports in the media, patients' opinions of duty hour limits and their effect have been understudied.

What is new

Patients expressed more concern about the negative effects of fatigue than about consequences of duty hour limits, such as more frequent transitions of care.

Limitations

Sampling bias may reduce external generalizability.

Bottom line

Patients' limited awareness of the consequences of duty hour limits, such as more frequent care transitions, represents an opportunity for education to increase public awareness of the multiple factors influencing patient safety.

To date, no study has examined public or patient perceptions after implementation of the 2011 duty hour regulations. Therefore, we sought to examine the views of hospitalized patients regarding resident fatigue, continuity of care, and work hour regulation.

Methods

A cross-sectional survey instrument was designed to measure perceptions in this descriptive and observational study. Questions were developed based on earlier work by the authors and the previously referenced patient and public perception studies.[13–15,25,26] Best practices in survey design were followed to improve the reliability and validity of survey results.[27,28]

Following approval by the Rhode Island Hospital Institutional Review Board, the survey was tested with patients using face-to-face interviews. The questions were iteratively refined for clarity and relevance. In particular, questions requiring knowledge of duty hour regulations or background with graduate medical training were eliminated. Definitions were created and added in the survey for terms like "resident" and "transfer of care." Expected responses were correlated with actual responses, and further modifications were made to improve response process validity. Finally, a pilot test with 20 patients was performed without intervention from the research staff. Results were analyzed

TABLE 2 **Duty Hour Perceptions—Percentage of Respondents (99% CIs)[a]**

On average, how many hours do you think a resident works in a typical shift?		On average, how many hours do you think a resident works in a typical week?	
8–12 hours	43.5% (35.6–51.3)	< 50 hours	14.8% (9.2–20.4)
13–16 hours	34.7% (27.2–42.2)	51–70 hours	**51.5% (43.6–59.4)**
16–24 hours	17.2% (11.2–23.1)	71–80 hours	21.8% (15.3–28.4)
> 24 hours	3.9% (0.8–7.0)	> 80 hours	11.3% (6.3–16.3)
Not reported	0.6% (0.0–1.8)	Not reported	0.4% (0.0–1.4)
What is the maximum number of hours a resident should be assigned to work in a shift?		I would like to be informed if a resident has been working ___ hours in a row.	
8 hours	20.3% (13.9–26.7)	8 hours	8.4% (4.0–12.8)
12 hours	**57.1% (49.3–64.9)**	12 hours	**41.3% (33.5–49.1)**
16 hours	14.4% (8.9–20.0)	16 hours	18.5% (12.4–24.7)
24 hours	3.3% (0.5–6.1)	24 hours	15.2% (9.5–20.9)
30 hours	1.6% (0.0–3.5)	30 hours	1.8% (0.0–3.8)
Not reported	0.2% (0.0–0.9)	Not concerned	10.5% (5.7–15.4)
		Not reported	3.9% (0.8–7.0)

Abbreviation: CI, confidence interval.

[a] Aggregate survey responses to questions on shift length. Bold indicates a statistically significant (nonoverlapping 99% CIs) majority (or plurality) response.

and a reliability assessment was performed demonstrating strong similarities between correlated psychometric items (Cronbach α 0.84 and 0.76, fatigue and transfers, respectively). The final survey consisted of 32 questions, including demographic information.

The survey was administered at 2 hospitals: a major academic medical center with a Level I trauma center and a smaller community teaching hospital. All adult inpatients under the care of a resident team were eligible for inclusion in the study; geographic bed distribution allowed for patient identification. As an additional confirmation, patients were asked if a resident had participated in their care. If they answered no or did not know, they were excluded from the study. Patients without decision-making capacity were excluded from the study, and patients who were not available on the day of surveying (eg, receiving treatment, visiting with family) were either revisited at a different time or excluded. Patient care was not interrupted to administer the survey.

Patient recruitment was performed daily for 10 weeks between June and August 2013. To avoid survey duplication, we implemented a tracking system using unique identifiers that were compliant with the Health Insurance Portability & Accountability Act for each enrolled patient. After data were collected, descriptive and inferential statistics were performed using Microsoft Excel. Confidence intervals were generated from standard error of proportions, and significant differences were established using 1-sample hypothesis test of a multinomial distribution. Subgroup analyses were performed to identify differences in demographic groups.

Results

A total of 513 surveys were obtained from 720 patients solicited to participate in the survey (71.3% response rate); 129 (17.9%) patients refused to participate or reported that they did not have residents participating in their care, and 78 (10.8%) did not complete the survey. Incomplete surveys were treated as nonresponses.

A nearly even distribution was noted between men (49.5%) and women (48.2%; TABLE 1), and the average age was 54.5 years. Length of stay varied between 1 and 30 days with an average of 4.1 days. Most patients (63.7%, 327 of 513) reported that this was not their first hospitalization at a teaching institution. Finally, most of those surveyed (86.7%, 445 of 513) reported that neither they nor any family members were physicians, and only 6.2% (32 of 513) reported familiarity with Accreditation Council for Graduate Medical Education (ACGME) duty hour regulations. Demographic data were self-reported in the survey and were not available from nonrespondents.

TABLE 3 **Fatigue, Duty Hours, and Transfers—Percentage of Respondents (99% CIs)[a]**

	Yes	No	I Don't Know
Are there rules limiting how many hours a resident can work?	22.4% (18.8–26.0)	7.1% (4.9–9.4)	**70.4% (66.5–74.4)**
Are you familiar with any of the ACGME rules for residents?	6.3% (4.2–8.4)	**83.6% (80.4–86.8)**	10.1% (7.5–12.7)
Do you think patients should help in making rules about resident work hours?	19.9% (16.5–23.4)	**58.6% (54.3–62.8)**	21.5% (18.0–25.1)
Have any of the residents caring for you seemed fatigued?	10.9% (8.2–13.6)	**67.8% (63.8–71.8)**	21.3% (17.8–24.8)
Do you think reducing resident work hours would make them less fatigued?	**71.9% (68.0–75.8)**	7.9% (5.6–10.2)	20.2% (16.7–23.6)
Do you think reducing resident work hours would reduce the amount of medical errors?	**61.5% (57.3–65.7)**	16.5% (13.3–19.7)	22.0% (18.4–25.6)
Do you think that medical errors commonly occur due to fatigue?	**63.1% (59.0–67.3)**	12.7% (9.9–15.6)	24.1% (20.4–27.8)
Do you think less experienced residents should have stricter limits on shift length than more experienced residents?	**56.5% (52.2–60.8)**	27.8% (23.9–31.6)	15.7% (12.5–18.8)
I am concerned that an error may occur from the number of hours worked by residents.	**58.8% (51.1–66.6)**	24.3% (17.6–31.1)	16.8% (10.9–22.7)
Do you think reducing resident work hours would worsen their education?	15.0% (11.9–18.1)	**65.0% (60.9–69.1)**	20.0% (16.5–23.5)
Do you think that important information can be lost during transfers of care?	**64.1% (60.0–68.3)**	16.7% (13.5–20.0)	19.1% (15.7–22.5)
Do you think that medical errors commonly occur during transfers of care?	37.5% (33.3–41.7)	22.6% (19.0–26.3)	39.9% (35.6–44.1)
When your care is transferred between doctors, do you feel as confident in your new doctor as you did your previous doctor?	**56.1% (51.8–60.4)**	21.1% (17.6–24.7)	22.7% (19.1–26.4)
I am concerned that an error may occur from my care being transferred from one physician to another during shift changes.	31.5% (27.5–35.5)	**43.3% (39.0–47.6)**	25.2% (21.4–29.0)
Do you think a member of your primary team should be in the hospital at all times?	**52.7% (48.4–57.0)**	31.4% (27.4–35.4)	15.9% (12.7–19.1)

Abbreviations: ACGME, Accreditation Council for Graduate Medical Education; CI, confidence interval.

[a] Aggregate responses to questions on fatigue, duty hours, and transfers of care. Bold indicates a statistically significant (nonoverlapping 99% CIs) majority (or plurality) response.

Patients reported that they thought that resident shifts ranged from either 8 to 12 hours (43.5%, 223 of 513) or 13 to 16 hours (34.7%, 178 of 513), and that residents work 51 to 70 hours per week on average (51.5%, 264 of 513). When asked the maximum consecutive hours that a resident should be assigned for a shift, 57.1% (293 of 513) reported 12 hours. More than two-thirds of patients (68.2%, 350 of 513) wanted to be informed if a resident had worked more than 16 consecutive hours (TABLE 2). The majority of those surveyed (70.4%, 361 of 513) did not know if there were regulations for resident duty hours, but 56.5% (290 of 513) believed that less experienced residents should have more strict regulation of shift length. Although 71.9% (369 of 513) thought reducing hours would decrease resident fatigue, nearly as many (67.8%, 348 of 513) reported that the residents caring for them did not appear fatigued. Many respondents (63.2%, 324 of 513) felt that medical errors occur because of fatigue, and even more (70.8%, 363 of 513) were concerned that the number of hours a resident works correlates with the possibility of an error occurring. More than half (61.4%, 315 of 513) believed that reducing work hours would reduce medical errors, and 64.9% (333 of 513) reported that they did not think reducing hours would have a negative effect on resident education (TABLE 3).

Although 64.1% (329 of 513) of patients believed that important information could be lost during transfers of care, only 1 in 5 (21.1%) felt less confident in their new physician after a handoff. In contrast to fatigue, a much smaller

TABLE 4 **Patient Preferences: Fatigue Versus Continuity—Percentage of Respondents (99% CIs)[a]**

What are you more concerned about?	
Physician fatigue	Transfers of care
76.4% (72.8–80.1)	23.6% (19.9–27.2)
Would you rather have:	
A fresh doctor who just started a shift, but received your information in a "sign-out" from your previous doctor.	A doctor you know well and who knows you, but may be tired from a long shift
57.2% (52.9–61.5)	42.8% (38.5–47.1)

[a] Aggregate survey responses for head-to-head questions on fatigue and transfers of care. Bold indicates a statistically significant (nonoverlapping 99% CIs) majority response.

proportion of respondents (37.5%, 192 of 513; odds ratio [OR], 0.56; $P < .01$) believed medical errors commonly occur because of transfers of care, and only 31.6% (162 of 513; OR, 0.45; $P < .01$) reported that they were concerned that an error might occur as a result of a handoff.

Finally, patients were more likely to report concern about errors due to resident fatigue than to handoffs (76.4% [392 of 513] versus 23.6% [121 of 513], $P < .01$). Given the choice between "a doctor you know well and who knows you, but may be tired from a long shift" or "a fresh doctor who just started a shift, but received your information in a 'sign-out' from your previous doctor," patients were more likely to choose the unfamiliar but fresh physician (57.1% [293 of 513] versus 42.7% [219 of 513]; $P < .01$; TABLE 4).

Discussion

In this study of hospitalized adult medical and surgical patients, respondents made good estimations regarding the hours worked by residents caring for them, but reported little knowledge about regulations for duty hours. Patient concerns focused on fatigue and reflected a common perception reported in the media: Fatigue causes medical errors. We believe this finding may be explained by a shared experience of fatigue by physicians and the public. While most individuals have some appreciation and even personal experience with exhaustion, the intricacies and potential dangers of complex transitions of care are vague and unfamiliar. As such, patients may be less concerned with transfers of care and loss of continuity than with fatigue. This sentiment contrasts with the considerable attention and efforts the ACGME, the Joint Commission, and other health care quality organizations (eg, AHRQ) have focused on reducing handoffs and improving the quality of communication during patient sign-out.

The public fixation on fatigue may explain why policy makers and the ACGME have focused attention on limiting resident duty hours. Despite the inclusion of new standards for transitions of care and enhanced resident supervision in the 2011 Common Program Requirements, duty hours remain a major focus. One reason may be that duty hours can be regulated with relative ease compared to handoffs and supervision. The relatively straightforward and concrete solutions for duty hour limits are contrasted by the subtleties involved with interventions and regulations for patient sign-out. Unfortunately, increased frequency of handoffs is unavoidable as duty hours are increasingly limited, and this should be considered by regulators and the public.

This study has several limitations. Perhaps the most significant weakness is the public knowledge gap regarding duty hour regulations, as well as regarding systems of graduation medical education, handoffs, and continuity of care. This knowledge gap was addressed by removing or revising any questions that required background knowledge or experience and, instead, exploring respondents' opinion of these variables. Interpretation bias is also an important consideration in survey research of this nature. Additionally, although efforts were made to include a broad sample of patients by surveying surgical, medical, and other specialty inpatients at 2 hospitals, respondents' demographics did not closely match those of the United States, and regional variations in demographics and use of only 2 study sites may affect the study's external validity. Selection bias may also have occurred by excluding patients who answered "no" or "I don't know" regarding resident participation in their care or for those who refused to participate. Finally, this study does not objectively measure patient safety outcomes but rather the perceptions of patients regarding these variables.

Conclusion

Despite the importance of public and patient perception, duty hour regulations should be driven by evidence supporting improved patient care as well as quality of

resident education. Although fatigue mitigation has been associated with improved quality of life for residents, studies to date have not demonstrated significant improvements in patient safety or resident education. Meanwhile, this survey demonstrates that patients remain concerned about the association between fatigue and negative safety outcomes. The gap between patient and physician perceptions on the issue of duty hour regulations highlights an area where public education might be focused to empower patients and members of the public to better understand graduate medical education and meaningfully contribute to decision making on duty hour limits.

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